MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2021/2022

PPC 0116 – PRE-CALCULUS

(All sections / Groups)

10 AUGUST 2022
9.00 a.m. – 11.00 a.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 2 pages (excluding the cover page) with 2 questions.
2. Answer all questions.
3. Unless stated otherwise, if an answer is given as a decimal, it should be rounded to **four** significant figures.
4. Show all relevant steps to obtain maximum marks.

QUESTION 1 [30 marks]

(a) Determine n given that $m=\frac{n+4}{3-n}$ and $m^2-9=0$. [5 marks]

(b) Solve the inequalities and equations below:

(i) $\left|\frac{y-2}{5}\right|>3$ [4 marks]

(ii) $6-3y=\sqrt{y^2+4y+4}$ [4 marks]

(iii) $\log_5(4y-5)=2$ [3 marks]

(iv) $2^{6x}-8^x=30$ [3 marks]

(c) For the functions $f(x)=\frac{1}{\sqrt{4-x}}$ and $g(x)=\frac{4}{x}$, find $g[f(x)]$ and its domain. [3 marks]

(d) For the function $y(x)=\frac{x^2-2}{x^3+3}$, find its x- and y-intercepts, if there are any. [3 marks]

(e) Sketch the graph of $f(x)=-\sqrt{5+x}+4$. For each stage of the transformation, state the transformation involved and sketch the corresponding graph. [5 marks]

Continued...

QUESTION 2 [30 marks]

(a) Use synthetic division to find the remainder of $f(x)=3x^4+x^3+4x^2-11$ when it is divided by $x-3$. Then, verify your answer using Remainder Theorem. [4 marks]

(b) Use long division method to find the quotient and remainder of $f(x)=\dfrac{x^4+2x^3+4x^2-1}{x^2-4x+4}$. [5 marks]

(c) Find the partial fraction decomposition of $\dfrac{1}{(x+1)(3x-2)}$. [6 marks]

(d) (i) Find the expansion of $(y-3)^5$ using the Binomial Theorem. [5 marks]

(ii) Find the tenth term in the expansion of $(p+2)^{11}$. [4 marks]

(e) Find the sum of the first 98 terms of the arithmetic sequence $\{5-n\}_{n=1}^{\infty}$. [3 marks]

(f) Find the sum of the first 11 terms of the geometric sequence: $\dfrac{5}{9},\dfrac{10}{27},\dfrac{20}{81},\ldots$ [3 marks]

End of paper